FITCHBURG GAS AND ELECTRIC LIGHT COMPANY
ELECTRIC DIVISION RATE REQUEST

DIRECT TESTIMONY OF
JAMES H. AIKMAN

Massachusetts Department of Telecommunications and Energy

D.T.E. 02 –

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1   **I.   INTRODUCTION**

2

3   Q.   Please state your name, address, and business affiliation.

4   A.   My name is James H. Aikman. My business address is 2921 Windmill Road, Suite 4,

5   Sinking Spring, PA 19608. I am a Managing Consultant with Management Applications

6   Consulting, Inc. (MAC).

7

8   Q.   Please describe MAC.

9   A.   MAC is a management consulting firm which provides rate and regulatory services,

10   including depreciation.

11

12   Q.   Will you please describe your education and business experience?

13   A.   I am a graduate of the University of Illinois from which I hold a Bachelor of Science

14   degree in Civil Engineering. I have worked in the area of depreciation since November

15   1967, when I assumed a position on the engineering staff of the Missouri Public Service

16   Commission (PSC). During my employment with the PSC, I assisted in the preparation of

17   numerous depreciation rate studies and testified regarding depreciation rates in two cases -

18   - one water utility and one electric utility. I was employed by Gilbert Associates from

19   August 1971 to June 1984, then by Management Resources International, Inc. from July

20   1984 until September 2001 when I joined MAC. Since 1971, I have worked on numerous

21   depreciation rate studies for gas and electric utilities and I have testified on depreciation

22   matters in Arkansas, Connecticut, Georgia, Illinois, Iowa, Kansas, Louisiana, Maine,

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1   Massachusetts, Missouri, Montana, New Hampshire, Ohio, Pennsylvania, Rhode Island,

2   South Carolina, Vermont, the City of New Orleans, Nova Scotia, Canada, and before the

3   Federal Energy Regulatory Commission.

4

5   Q.   Are you a registered professional engineer?

6   A.   Yes. I am registered in the states of Illinois, Missouri, Pennsylvania and Virginia.

7

8   Q.   Are you a member of any professional organizations?

9   A.   Yes, I am a member of the American Society of Civil Engineers and the Society of

10   Depreciation Professionals.

11

12   Q.   Please describe the duties and responsibilities of your current position

13   A.   As the depreciation specialist of our organization, I am currently Project Manager of

14   several depreciation rate studies, including the studies of the Fitchburg Gas and Electric

15   Light Company (FG&E or the Company) for both the gas and electric divisions. As

16   Project Manager, I am responsible for planning the studies, delineating and coordinating

17   data collection, ensuring the accuracy of the data and properly reflecting any accounting

18   adjustments.   Beyond data collection, I am responsible for the performance and

19   interpretation of statistical analyses and the preparation of appropriate schedules to reflect

20   the results of the studies.

21

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2   **II.   PURPOSE OF TESTIMONY**

3

4   Q.   What is the purpose of your testimony?

5   A.   The purpose of my testimony is to present and support the current depreciation study and

6   associated depreciation accrual rates for the electric division of FG&E.

7

8   Q.   Was the FG&E electric division depreciation study made by you and/or under your

9   supervision and direction?

10   A.   Yes.

11

12   **III**.   **SUMMARY**

13

14   Q.   Have you prepared an exhibit summarizing your studies?

15   A.   Yes, the results of my study is shown in a report titled "Fitchburg Gas and Electric Light

16   Company – Depreciation Rate Study - Depreciation Accrual Rates Based On Electric, Gas

17   and Common Plant in Service at December 31, 2001" (the Depreciation Study) identified

18   as Schedule JHA-1 (Electric).

19

20   Q.   Please summarize the results of the Depreciation Study.

21   A.   As shown on pages 38 and 39 of the Depreciation Study, Schedule JHA-1 (Electric), the

22   composite of the proposed individual electric plant account rates is 4.73%, and for common

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1   plant, 6.19% (page 42).   The new accrual rate results in an estimated increase of

2     $1,065,400 in the electric plant depreciation expense (as shown on page 10 of Schedule

3   JHA-1 (Electric).   The significant increase in the depreciation rates over the existing

4   depreciation accrual rates is primarily due to changes in net salvage estimates, although the

5   electric plant increase is somewhat offset by higher average life estimates.

6

7   Q. Are the contents of the Depreciation Study true and correct to the best of your knowledge?

8   A.   Yes.

9

10 **IV.   DESCRIPTION OF DEPRECIATION**

11

12 Q.   Are you familiar with the National Association of Regulatory Utility Commissioners

13   definition of depreciation?

14 A.   Yes.   The definition of depreciation adopted by the National Association of Regulatory

15   Utility Commissioners (NARUC) is:

16

17   "Depreciation, as applied to depreciable utility plant, means the loss in service value

18   not restored by current maintenance incurred in connection with the consumption or

19   prospective retirement of utility plant in the course of service from causes which are

20   known to be in current operation and against which the utility is not protected by

21   insurance.   Among the causes to be given consideration are wear and tear, decay,

22   action of the elements, inadequacy, obsolescence, changes in the art, changes in

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1   demand, and requirements of public authorities."

2

3   The Massachusetts Department of Telecommunications and Energy (DTE) is a member of

4   NARUC.

5

6   Another commonly referenced definition of depreciation is that of the American Institute of

7   Certified Public Accountants (AICPA):

8

9   "Depreciation accounting is a system of accounting which aims to distribute the cost

10   or other basic value of tangible capital assets, less salvage (if any) over the estimated

11   useful life of the unit (which may be a group of assets) in a systematic and rational

12   manner. It is a process of allocation, not of valuation. Depreciation for the year is

13   the portion of the total charge under such a system that is allocated to the year.

14   Although the allocation may properly take into account occurrences during the year,

15   it is not intended to be a measurement of the effect of all such occurrences."

16

17   The two foregoing citations are found on pages 13 and 14 (respectively) of "Public Utility

18   Depreciation Practices", August 1996, by the NARUC Staff Subcommittee on

19   Depreciation.

20

21   It is in my opinion the AICPA definition helps clarify the NARUC definition in that it

22   brings out the "allocation of cost" aspect.

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1

2   Q.   What is the purpose of periodic book depreciation rate studies, such as those which you

3   performed for the Company?

4   A.   Consistent with the definitions above, the purpose of depreciation studies is to develop

5   depreciation accrual rates reflective of engineering judgment, current industry and specific

6   company experience, and current projections for the future, for the particular depreciable

7   assets under study. The objective of depreciation as an element of the cost of service is to

8   provide for the appropriate recovery of the investments in depreciable assets over a life

9   term that assures the full recovery of the investments less estimated net salvage.

10

11   **V.   PROCEDURES EMPLOYED**

12

13   Q.   What procedures did you employ in your study?

14   A.   First, I created the depreciation study data bases on our computer. The Company provided

15   us with the necessary property accounting history to create the data bases through year end

16   2000 and 2001. I was also provided the FG&E recent electric and common plant account

17   level gross salvage and removal cost histories. In addition, I inspected the actual physical

18   plant of the Company and held discussions with the Company management concerning

19   matters relevant to depreciation.

20

21   Q.   What did you do next in your study?

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1   A.   I analyzed the historical data using computerized statistical routines and evaluated the

2   output by considering the indications from the statistical analyses of plant accounting

3   history, input from Company management, the character of the depreciable assets,

4   knowledge gained during property inspections, my experience with like assets, and

5   engineering knowledge and judgment. Final calculations were then made to develop the

6   recommended remaining life accrual rates for each category of plant as shown in the

7   Depreciation Study (Schedule JHA-1 (Electric)) sections entitled "Schedules" (pages 38 to

8   42).

9

10   Q.   You previously referred to "statistical analyses". Would you please explain what is meant

11   by this term?

12   A.   I am referring to Simulated Plant Record (SPR) life analysis, a well known and well

13   accepted technique employed in depreciation studies. Whenever there is an adequate

14   volume and frequency of additions and retirements, it is possible to perform SPR life

15   analysis.

16

17   SPR life analyses are known by some as "semi-actuarial life analyses". The SPR-Balances

18   (BAL) analysis I used in these studies is an iterative procedure in which certain values

19   (survivor factors) from empirical survivor curves (Iowa curves) are applied to the actual,

20   recorded annual additions to generate theoretical surviving year-end balances.   The

21   procedure identifies the empirical curves that best simulate the actual ending balances in a

22   specified band of years. As an example, the bands of balance years simulated in these

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1   studies were primarily 10 years (1991 to 2000), 20 years (1981 to 2000), and 30 years

2   (1971 to 2000).

3   The Iowa survivor curves were developed in the 1930's at Iowa State University; they are

4   empirical curves whose equations are published, along with tables of various values, e.g.,

5   survivor factors at various ages. Iowa curves are widely accepted in the industry as a

6   common and convenient means of communicating and calculating technical depreciation

7   parameters.

8

9   The SPR life analyses of property history can sometimes provide us with an estimate of the

10   life of some historical investments, that is, a starting point in the life estimation process;

11   however, it must be noted that life analysis is not life estimation. Unfortunately, life

12   analysis can only provide a clue as to what has happened in the past. My obligation is to

13   estimate what will occur in the future; i.e., I must predict the future, not merely measure the

14   past.

15

16 Q. Did you employ any other analyses other than SPR to assist in the life estimation process?

17 A   Yes. I also studied the pattern of annual additions to and annual retirements from the plant

18   accounts to estimate the likely age of retirements, the approximate ages of the balance in

19   the accounts and to measure the volumes of additions and retirements in various time

20   periods.

21

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1   Q.   In evaluating the SPR life analyses, you previously stated that you also considered input

2   from the Company. What type of information were you seeking?

3

4   A.   I conferred with the Company management to determine if there were any occurrences,

5   changes in policy, procedure, equipment, or practices which might impact upon service

6   lives, salvage, or removal cost associated with depreciable assets. My major consideration

7   was to determine whether indications of the past would likely be representative of the near-

8   term future.

9

10 Q.   Can you give any examples of specific input provided to you by the Companies which

11   influenced your life estimates?

12 A.   I was advised that manufacturers of electric substation equipment (relays, circuit breakers,

13   transformers, etc.) "support" the equipment for far fewer years than in the past; that is, they

14   no longer manufacture spare parts for as long a time period as in the past. The result is

15   utilities are sometimes forced to replace equipment as opposed to repairing it. I have heard

16   this same story in Massachusetts and other states. To ignore this fact in the life estimates

17   of substation equipment would be negligent.

18

19 Q.   Your answers to previous questions indicate judgment and experience are significant

20   elements in life estimation and in the interpretation of statistical analyses.   Do other

21   depreciation experts and authoritative sources concur?

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1   A.   Yes, the literature is very clear on this point. For example, on page I.1, The New York

2   State Department of Public Service publication "Computer Supported Property Mortality

3   Studies" published in 1971 states:

4

5   "The purpose of an actuarial mortality study of public utility property is to make a

6   statistical determination of a representative life table and average service life. The

7   method used to derive these quantities in this report is that of smoothing and

8   extending the retirement ratios.

9

10   It must be clearly understood that the computer procedure explained in Section II

11   accomplishes electronically only those computations which have had to be done

12   manually, and nothing else. Because of the computer's large storage capacity and

13   extremely fast running time, it is able to calculate a great deal more than has ever

14   been obtained manually in the past.

15

16   The computer exercises no judgment, reflects no opinions or company policies and

17   does not forecast the future. The computer programs are merely the results of

18   applying certain mathematical formulae to a set of statistics obtained from

19   accounting records - and, based on these data and formulae give an indication of

20   what has been the retirement experience of the past and what would be the future life

21   pattern if the same experience were constant over the entire life of the surviving

22   property under study.

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2   Under no circumstances should it be construed that a specific indicated service life

3   and life table developed by this computer process must necessarily be used as the life

4   table and average service life in arriving at a final estimate of annual and accrued

5   depreciation. Stress is placed on the fact that the selected life table and average

6   service life finally used, whether or not developed by program PSU-2 or PSU-2A

7   must be the engineer's best estimate for the property under study".

8

9   Q.   Can you provide other citations?

10 A.   Mr. Alex E. Bauhan, the person who developed the SPR - Balances Method of life

11   analysis, cites the need for exercising judgment in his paper in which the Balances Method

12   was introduced to the industry. In his paper, given in April 1947, to the National

13   Conference of Electric and Gas Utility Accountants of the American Gas Association

14   (AGA) and Edison Electric Institute (EEI), under the heading "Multiple Indications" he

15   states,

16

17   "The method reads the past and not the future, and has no way of telling which

18   patterns will be followed in the future. Neither the actuarial or any other statistical

19   process can eliminate this dilemma. Only by the exercise of reasonable judgment, or

20   by the passage of time, can a selection be made.

21   In discussing the Retirement Experience Index, regarding the situation where the index is

22   "poor or valueless", Mr. Bauhan states,

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2   "In all such cases, for estimating purposes, the result of the analysis should be

3   discarded and a judgment figure should be substituted in place of it. In those cases

4   where the experience index is only fair, the result should be examined critically, and

5   if it is not supported by reasoned judgment, it should be accordingly modified."

6

7   Mr. Bauhan's paper is found in the Edison Electric Institute Publication No. 51-23, titled

8   "Methods of Estimating Utility Plant Life" published in 1952; the foregoing citations are

9   found on pages 61 and 63, titled respectively. A copy of his paper is included as Appendix

10   A (pages 43 and following) in the Depreciation Study.

11

12   The Retirement Experience Index (REI) is the percentage of the accumulated retirements

13   with the given Iowa curve from the oldest capital addition, e.g., if the oldest addition was

14   1930, by convention it would be 70.5 years old at year end 2000. If the Iowa curve in

15   question was a 35 year $L_{1.0}$, the REI would be 96; that is, the 35 year $L_{1.0}$ Iowa curve

16   shows 4% surviving at age 70.5 years and 100% less 4% equals 96%.

17

18   There are many more citations to the need for use of judgment in life estimation, several of

19   which have been included in my testimony in previous regulatory proceedings in

20   Massachusetts. Notably there are a number of the them in Iowa State University Bulletin

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1   125,[1] which is the primary reference for the Iowa curves.

2

3   In summary, life estimates cannot and must not be interpreted without the use of informed

4   judgment.

5

6 Q. Are you suggesting that the statistical analysis of past retirement experience has little value

7   in estimating asset lives?

8 A. No, the point of the foregoing is that life analysis is not life estimation; it takes more than

9   analyses of history to make realistic average life estimates.

10

11   In making my recommendations, I rely on my experience in performing numerous

12   depreciation studies, beginning with my almost four years employment on the engineering

13   staff of the Missouri Public Service Commission, followed by 13 years with Gilbert

14   Associates, 17 years with Management Resources International, Inc. and my close work

15   with regulatory commission staff engineers in several states, including Missouri, Arkansas,

16   Ohio, Florida, Maryland, and Connecticut. In cases where staff engineers have made their

17   own independent studies, those studies have yielded comparable results that support my

18   conclusions.

19

20 Q. Have you employed your judgment in the case at hand?

---

[1] "Statistical Analyses of Industrial Property Retirements" by Robley Winfrey, published in 1935 by the Engineering Research Institute at Iowa State University.

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1   A.   Yes, and in that regard, I have conferred with the FG&E management and operating

2   personnel, I have made property inspections, I have reviewed and considered the types of

3   property in the various primary plant accounts, and I have made life analyses of the history

4   of the property. I have relied upon all my prior experience as an engineer in evaluating and

5   interpreting the life analysis indications.

6

7   Q.   You stated earlier that you made property inspections in connection with this study. Were

8   the property inspections made to ensure the facilities are adequately maintained?

9   A.   Surely that was one objective; however, the inspections were intended to serve several

10   functions. First and foremost, the inspections verified that the assets identified on the

11   Company's books actually exist. Second, the inspections verify that the assets continue to

12   be maintained and are useable. In addition, inspections facilitate discussions regarding the

13   existing facilities with the Company management who accompany me and provide me a

14   better understanding of the overall system and the equipment.

15

16 **VI.   DEPRECIATION ACCRUAL RATES**

17

18 Q.   What are the total, composite annual electric and common plant accrual rates which result

19   from your study?

20 A.   The respective composites of the proposed individual account rates detailed in the

21   Depreciation Study are 4.73%, and 6.19%, as shown on pages 39 and 42 of Schedule JHA-

22   1 (Electric), the Depreciation Study.

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1

2   Q.   The electric plant depreciation accrual rates you propose result in considerably higher

3   depreciation expense than that derived using the existing depreciation accrual rates. What

4   is the reason for the increase?

5   A.   The most significant factor responsible for the increased electric plant depreciation rates

6   are the changes in the net salvage estimates. In addition, the Depreciation study (Schedule

7   JHA-1 (Electric)), at page 8, shows that the electric plant average life estimates are higher

8   than those which are reflected in the existing depreciation accrual rates. It is a given in

9   most instances that the lower the average service life, the higher the depreciation accrual

10   rate and the lower the net salvage, the higher the depreciation accrual rate. The change in

11   net salvage caused an increase in the electric plant depreciation rates, which was somewhat

12   offset by the higher average life estimates, resulting in a net increase to the depreciation

13   accrual rates.

14

15   Q.   Your previous response infers that your net salvage estimates are lower than those implicit

16   in the existing depreciation accrual rates. Why are your estimates lower?

17   A.   In an overall sense, environmental concerns and disposal requirements have changed since

18   the prior depreciation rate studies. These concerns and requirements impact all businesses

19   and all of us personally. For example, I now pay a fee to dispose of automobile tires and

20   batteries that I didn't pay 20 years ago and I pay $25 to $40 for the disposal of each

21   mattress, stove, refrigerator, etc. As to electric utilities, another example is oil-filled

22   equipment, such as line transformers. Twenty years ago utilities could realize gross

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1   salvage via the sale of retired transformers for scrap, whereas now they must pay to have

2   them hauled away.

3

4 Q. In the Depreciation Study you talk of your estimates being conservative. Can you provide

5   an example as to how you exercised some conservatism in establishing the depreciation

6   rates?

7 A. Yes. In Account 367, Underground Conductors and Devices, FG&E has realized net

8   salvage of (125.2)% in the 1981 to 2000 period, (128.6)% in the 1991 to 2000 period and

9   (158.2)% in the 1996 to 2000 period. My proposed accrual rate incorporates an estimated

10   (50)% net salvage, a more realistic value, in my opinion, and a parameter which contributes

11   to a lower accrual rate than if (125)% or (150)% had been used.

12

13 Q. The proposed common plant depreciation rates are also higher than the existing. What is

14   the reason for the change?

15 A. In the case of common plant, my net salvage estimate is higher than the existing, which

16   mitigates to some extent the effect of the lower average life estimates of my study.

17

18 Q. Does the Depreciation Study provide a comparison of the existing average life and net

19   salvage estimates to those you propose?

20 A. Yes. The Summary section of the Depreciation Study contains such comparisons and also

21   a comparison of the estimated depreciation expense. These are on pages 8, 9 and 10.

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1   Q.   Does this complete your testimony?

2   A.   Yes.

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